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# AMSAT SATELLITE REPORT



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## **UoSAT Readied For Launch**

Integration of the UoSAT Spacecraft with the Delta 2310 launch vehicle should be nearly complete as you read this. In the past two weeks a number of significant milestones have been passed leading to this juncture with UoSAT, the first Amateur Scientific Satellite, poised for its destiny.

UoSAT arrived at Dulles International Airport near Washington, D.C. on Tuesday, 25 August. The Integration team from the University of Surrey arrived with the spacecraft. UoSAT spent Wednesday, 26 Aug. clearing U.S. Customs and was taken that evening to the AMSAT Spacecraft Laboratory at the Goddard Space Flight Center, Greenbelt, Md. Uncrated and powered up, the bird was found to have made the trip in splendid form. All systems worked perfectly. Thursday, the UoSAT was transported a short distance across Goddard to the Magnetic Test Facility where final calibration of the flux-gate magnetometer was to be accomplished. The procedures went without incident until about 1500 hours Thursday when it was discovered that the magnetometer's Z-axis output channel was dead. Troubleshooting began immediately and it was discovered before long that a short circuit existed in one of the cable harnesses. Further tracing located the source of the problem. The harness had been pinched near the point where the gravity gradient stabilizer boom entered the spacecraft. The boom is 50 feet (15-1/4 meters) long and is fully deployed only in orbit. Had the cable pinch not been revealed by the short circuit, there is a chance that the boom would have broken in orbit with the result being a very serious degradation in mission performance.

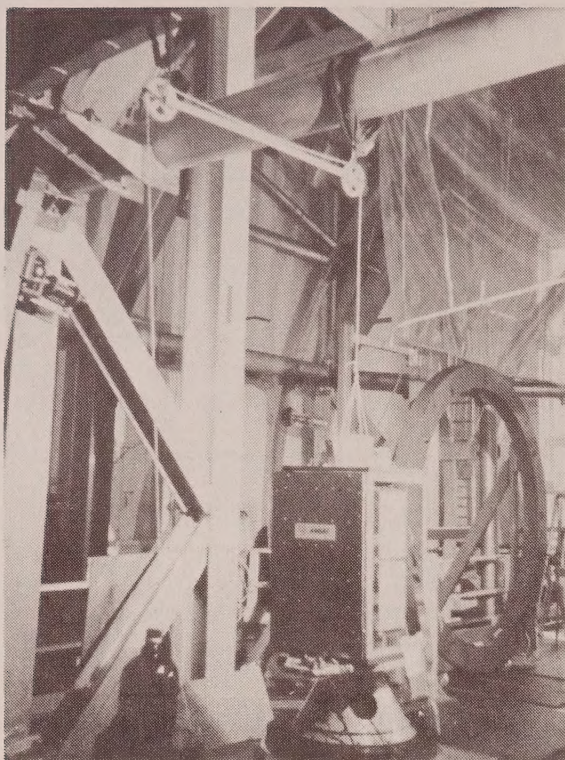
In order to repair the cable pinch and to subsequently test the deployment of the boom, an elaborate mechanism was contrived. The boom has at its tip a two-kilogram mass. In normal gravity the torque induced at the root of the boom when the boom is extended is sufficient to snap the boom entirely. Only in the environs of space and the dynamically balanced conditions extant after magnetic torquing can the fragile boom be deployed safely to stabilize the spacecraft. So in the Magnetic Test Facility a system of weights and pulleys was rigged to support the fragile boom during the deployment tests. Happily, the problem with the cable was repaired and the boom deployment tests were flawless.



**G3YJO and G6BTU examine UoSAT components during tests.**

On Thursday, during the very late hours, UoSAT was packaged for its trip to California on Friday. The next-to-last leg of the trip (on earth) for UoSAT came Friday, 28 Aug. when the bird and crew flew off to Southern California. UoSAT then spent Saturday at the QTH of KL7GRF in Los Angeles, who is managing logistics for UoSAT in California. On Sunday morning, 30 Aug., UoSAT was transported to Vandenberg AFB, California, the site of the September launch.

While affairs with the hardware itself seemed to be well in order, events played out elsewhere were affecting the actual launch day for UoSAT and its fellow spacecraft-traveler SME (Solar Mesospheric Explorer). While the UoSAT was on its aircraft ride to California Friday, a test of a Thiokol rocket at a NASA test facility proved a disastrous failure: the rocket exploded with a resounding report. The test was of a rocket to be used with another launch of a satellite called SBS (see ASR No. 14, 24 Aug. 81, p. 1). Since the failure of this rocket affects the launch date for UoSAT as detailed in ASR No. 14, it was not certain at press time if the 22 Sept. date most recently quoted as "most likely" was still credible. It appears from early diagnosis of the affects of the failure of the SBS rocket that the launch window for UoSAT might be opened somewhat to allow a slightly earlier launch. The "talking dates" now being discussed most often in-



Inside the Magnetic Test Facility at NASA.

## WA6VGS Claims First Mode-J W.A.S.

Los Angeles Area Coordinator Jack Somers, WA6VGS, has submitted 50 QSLs to ARRL for verification and is claiming that he is the first ever to accomplish the feat of Mode-J W.A.S. The first J QSO he logged for W.A.S. was W7US on 3 Apr. 80. However, he didn't really get going on the path to the present accomplishment until April 81. Since then he has worked 41 states on Mode J. Jack says the last few states were difficult often with skeds proving unworkable for one reason or another. Several states weren't even represented on J and so Jack had to work doubly hard to interest someone enough to give it a try. Jack says Alaska took the most work and he finally got KL7WE, an experienced EME enthusiast, to help out with a J contact from the Klondike. Jack says that the level of help from other amateurs was truly extraordinary. His last needed state was Rhode Island and K1DS went so far as to climb up a ladder to his roof at night with a flashlight to install the much-needed preamp so Jack could garner R.I. for the 50th. WA4LDU (his S.C. QSO) worked Jack on borrowed equipment to help. Another individual purchased a 70 cm antenna just so he could work WA6VGS and gave Jack his J W.A.S.

In discussing the feat with ASR Jack gave us a quick rundown on the equipment he uses to work Mode-J. The uplink is a IC-211 driving a Lunar amplifier to a Cushcraft seven-element, linearly polarized Yagi. The downlink equipment comprises a Cushcraft 11-element linearly polarized Yagi feeding a Lunar PAG-432 preamp (mast mounted) and then to an IC-451A. Assuming Jack's W.A.S. submission is approved, his next goal, he says, will be all Canadian Provinces on Mode-J. Congratulations to WA6VGS and good luck in the future challenges!

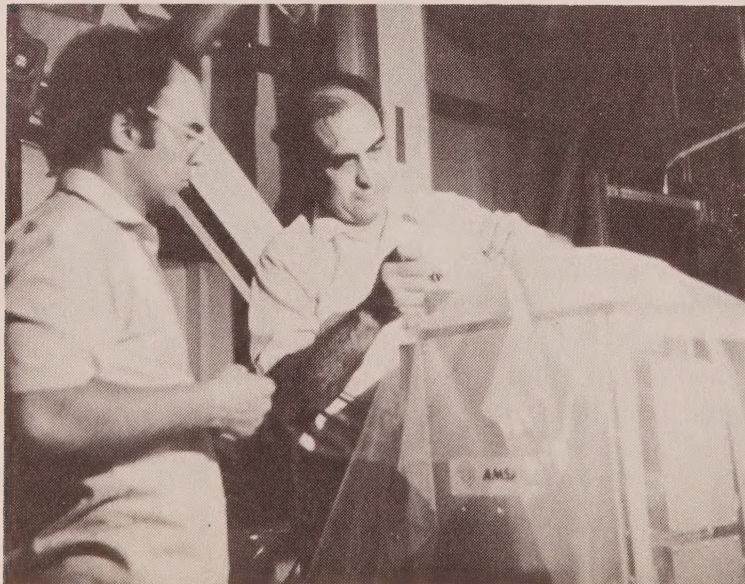
Below is a list of stations worked by WA6VGS for W.A.S on Mode-J.

AL	N4EL	LA	WA6ERB/5	OH	WB8OTH
AK	KL7WE	ME	K1RQG	OK	K5CM
AZ	W7US	MD	W3JPT	OR	W7QLC
AR	W4UHJ	MA	WA1MBA	PA	W3HV
CA	W6CG	MI	WB8FGZ	RI	K1DS
CO	KØRZ	MN	WØCA	SC	WA4LDU
CT	W9KDR/1	MS	W5UCY	SD	WØVP
DE	K3JL	MO	WØSL	TN	WA4NVM
FL	W4BE	MT	KA7DLC	TX	WA5ZIB
GA	KA4NEC	NB	WBØIUT	UT	K17L
HI	WH6AMX	NV	KA7ZOK	VT	K1LJL
ID	AC7P	NH	WB1CJT	VA	WA4SBC
IL	K9CIS	NJ	W2GAX	WA	W7UFE
IN	W9BZ	NM	WA5VAH	WV	W8TN
IA	WØRPK	NY	WA2LQQ	WI	W9HR
KS	KØSMI	NC	K4UAS	WY	W7KMF
KY	AB4Y	ND	WØEOZ		

clude 20-25 Sept. Again the best advice seems to be to tune to the AMSAT Nets which serve your area for the latest launch date estimate.

Meanwhile, plans for the AMSAT Launch Information Network/Service (ALINS) were advancing. A second transmitter has been allocated for the 20-meter operation and the network now appears to have all of the major service areas covered. Europe will be served by transmission from the AMSAT-UK Organization on 7080 and 3780 kHz and 144.280 MHz from London. Europe will be served from the East Coast of the United States on 14,282 and 21,280 kHz by WA3NAN and WA2LQQ. The Asia-Pacific service area will be served on 14,305 and 7182 kHz from the West Coast. American listeners (North, Central and South) will be served by all four U.S. stations and should tune to the one which is strongest in their area.

### G3YJO and LU9HBG



### AO-8 Reference Orbits

8 Sep	17891	01:39:52	88.4
15 Sep	17988	00:29:03	70.9
22 Sep	18086	01:01:24	79.1

## ASR Spotlight On: Norm Bernstein, K2KLV

Norm is one of those individuals who is happiest when he can enjoy various aspects of the radio art/science. We use the "art/science" words juxtaposed for good reasons. Norm's activities include such varied perspectives on the subject of radio that it is difficult to even encapsulate the diverse views. For example, Norm is a communications integration engineer for the government. As such he does most of his professional work, (You guessed it), *Radio*. Of course he has a very active amateur radio "habit", but that's not all. Not content to transmit only on the amateur bands, Norm has for three years hosted a Saturday morning commercial radio show dealing with amateur radio and SWLing and, we would surmise, occasional CB topics. Norm's radio show is carried on the Utica, New York, CBS radio affiliate, WIBX. Norm recently received the National Public Service Award for his superb spokespersonship on behalf of amateur radio.

First licensed in 1955 as KN2KLV, this native of Utica found that as a Technician Class licensee his best QSOs on 6 meters were often with his neighbors TV; the TVI problem on channel 2 was persistent and discouraging. Nevertheless, his interest was keen and would later prove integral to the enthusiasm now clearly evidenced.

In the mid-seventies Norm's interest in VHF activity was rekindled by his working in a local radio store part-time to help pay for his equipment purchases. In a milestone dialog with former AMSAT Director Will Webster, WB2TNC, Norm took up the challenge of AMSAT-OSCAR 6 and later AO-7. By 1978 he had perfected his techniques and equipment to the extent that he could rightly claim the first-ever mobile Mode J contact which he accomplished with W9KDR/1 on the other end.

## AMSAT Silent Key

AMSAT recently lost one of its long-time active supporters when Karl Klein, W6DOW, passed away in a California hospital after a lingering illness. As reported previously (ASR #14, 24 Aug. 81), Karl had been hospitalized and AMSAT members were encouraged to extend greetings to him in hopes of cheering our ailing colleague. Karl's widow indicated that his last days were indeed brightened by the receipt of greetings from around the world. His passing occurred on Thursday, 27 Aug. The announcement of Karl's passing at the Project



K2KLV (left) receives an award from Major Robert McCauley, N2ARH, for an OSCAR talk given before a meeting of the Armed Forces Communications Electronics Association (AFCEA).

Today Norm is in the process of again upgrading his station with the major components coming from Yaesu, Mirage and Microwave Modules. But we suspect Norm's heart is most heavily biased towards mobiling. What else could one think of a ham who installs a 2 meter rig in his BMW motorcycle and installs the antenna on the sidecar?! His most unusual QSO was (would you believe *this* one?) "Milk-stool-mobile." It seems a farmer-ham friend of his in rural Utica attached a 5/8 whip to the milk stool so he could rag-chew while working. We hope the farmer had enough sense to keep the RF levels down as 'ol "Bossy" might get a bit edgy with the tingle of RF on the friend's finger tips!

Norm's XYL, Kathy, was recently licensed as KA2LHF. Since Norm spends a lot of time at remote sites supervising the installation of RF and digital equipment, he figures that if Kathy is also licensed it will make keeping in touch that much easier.

When at home, Norm's ham activities include, in addition to OSCAR work, SSTV and good old-fashioned rag chewing. And, as a dedicated mobiler, he looks forward to expanding his mobile horizons in the future. Those of you looking forward to Phase IIIB had best take notice. Norm will very likely be the first and for a long time, the *only* mobile you'll hear on Phase IIIB. When it comes to doing the difficult in the mobile, Norm makes it look easy. See you on the L-band transponder! ASR salutes this FB OM, Central N.Y. Area Coordinator, on his Public Service and technical achievements.

OSCAR meeting on Saturday, 29 Aug., cast a somber note on the otherwise very up-beat event. Karl had been active in Project OSCAR for many years and had assumed leadership roles on several occasions. He was a ground control station for AMSAT-OSCARs 6 and 7 as well as the Net Control Station for the Pacific Coast AMSAT 75 meter Net. A fine individual and an AMSAT stalwart for years, the W6DOW key falls silent and all are lessened by his passing yet were enriched in having known this fine OM. He will be missed.

## AO-7 Sighted Again

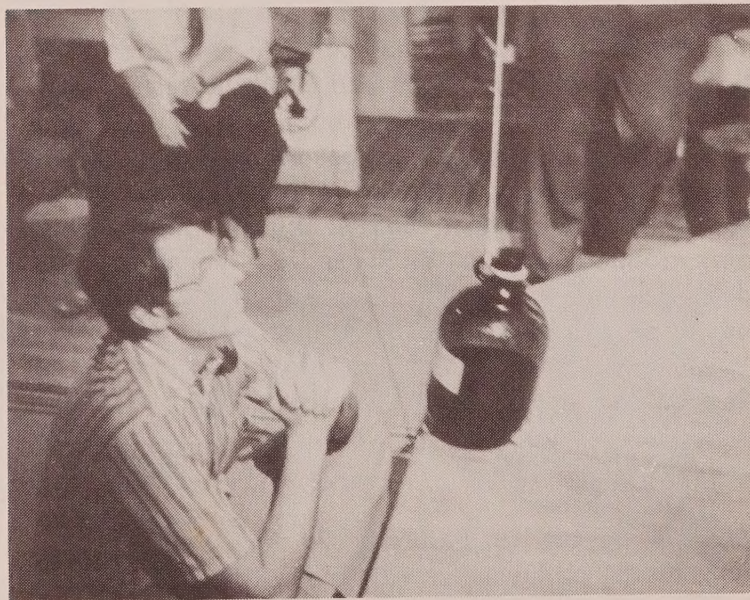
AMSAT-OSCAR 7 has been observed by two more amateurs. In ASR #14 it was reported that G4JJ heard the 435.1 MHz beacon on 8 August. Now comes a report from "down under" that on 17 August VK5AGR and VK5HI both heard the 70 cm beacon. In none of these recent observations has any telemetry been recovered from the very weak beacon. All three observers report only a steady carrier with clear evidence of Doppler shift. These reports are entirely consistent with the working hypothesis that has developed with regard to the cause of AO-7's failure in early June. (See ASR #10, 19 June 81.)

## Satellite Activity: HI

AMSAT South Pacific Area Coordinator, Rick, WH6AMX, reports growing satellite activity from the South Pacific. Among the more active stations in Hawaii are: AH6AP (Byron), WH6ACG (Paul), KH6FMT (John), KH6IBA (Carl), KH6P (Dan) and WH6AMX. All are active on Mode A and by now most will have Mode J capability as well. We suspect the Pacific sunshine works wonders for satellite antenna parties!

Around the South Pacific, Rick notes increasing activity from New Zealand with ZL1BDU, ZL1AKW, among the more frequently-heard. John, P29JA; Paul, YJ8NPS from New Hebrides; Peter, H44PT, from the Solomon Islands add to the tropical DX menu.

Three successful contacts have been logged between Hawaii and Japan—where a maximum 30 second window makes timing critical. The contacts between WH6AMX and JA8DJJ occurred on Mode J.



Can anyone figure out what W3GEY is doing -- and what purpose the bottle serves? Write to WA2LQQ, P.O. Box 177, Warwick, NY 10990. A hint: the photograph was taken during the UoSAT tests.

## Meeting Attracts OSCARites

Project OSCAR held its scheduled meeting in Southern California on Saturday, 29 Aug. and approximately 100 attended the meeting. A special feature of the meeting was the appearance of most of the UoSAT Launch Integration Team including: (from England) Martin Sweeting, G3YJO; Christine Sweeting, G6APF; Ian Ferebee, G3BTU; Tony Jeans, G8ONO; Jerzy (Uri) Slowikowski; (from U.S.) Jan King, W3GEY; Gordon Hardman, KE3D/ZS1FE. The UoSAT team gave a short presentation and answered questions from the floor.

Another prominent feature of the meeting was the presentation of status reports on the SYNCART, the joint Project OSCAR/AMSAT Canada project aimed at building the first amateur geosynchronous satellite.

Three significant donations to the Amateur Space Program were announced at the meeting. Harry Bluestein, N6TE, carried a donation of \$1000 from the San Diego Radio Club. The presentation to the ARRL Foundation Matching Fund Program ensures a \$2000 yield for the Space Program. Personal donations of \$500 each to the matching fund were made by Mort Miller, W6HEW, and Vic Ruebenhausen, W6WNK. All three donations were accepted on behalf of the ARRL Foundation by Jay Holladay, W6EJJ, Chairman of the Amateur Satellite Service Council (ASSC). Jay is also ARRL Southwest Division Director.

Significantly, four of the current nominees for AMSAT Director were on hand for the meeting: W6CG, KL7GRF, W3GEY, and W6SP. Nothing like a Saturday afternoon meeting to bring out the candidates!

## UoSAT Specs Updated

ASR has been informed that two of the technical specifications of UoSAT quoted in ASR #14 are not accurate. Specifically, both the S-band and X-band beacons (2.4 and 10 GHz, respectively) will use LHCP rather than RHCP as incorrectly stated in ASR. Second, the period of the orbit will be 95 minutes rather than the 98 minutes reported in the April 81 UoSAT Bulletin and quoted by ASR. ASR regrets having passed on this erroneous information.

## Back Issues of ASR Still Available

From time to time we are asked if back issues are available, and if so, what is the cost? The present policy is to ask \$1 for a single copy, 50 cents for each additional one. Of course, an individual may back date his original subscription to any issue date and receive the "missing" issues at no additional cost. At the moment, all back issues remain available, however the supply of some of the earlier ones is slowly becoming exhausted.